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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,360	03/04/2002	Petros Tsipouras	9952-042-999	1541

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EXAMINER	
CLOW, LORI A	
ART UNIT	**PAPER NUMBER**
1631	

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,360	TSIPOURAS ET AL.	
	Examiner	Art Unit	
	Lori A. Clow, Ph.D.	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/17/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-37 are currently pending.

Information Disclosure Statement

Due to possible errors in the transition from paper files to electronic files, the IDS submitted 17 June 2002 has been only partially considered. No foreign patent documents or non-patent literature has been received. Applicant is kindly requested to re-submit these references for consideration.

Priority

The benefit claim to provisional application 60/084,893, filed 19 May 1998, PCT/US 99/10026, filed 7 May 1999, and 09/421,956, filed 20 October 1999 is acknowledged.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The

filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 19 and 26-36 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 114 and 125-135 of copending Application No. 10/130,559. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-4, 6-8, 16, 20, 21, 24-26, and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claim 2, the wording is non-sensical and it is unclear what applicant intends. Perhaps the claims should read "the method of claim 1, wherein processing body fluid or tissue samples comprises", if that is what applicant intends to describe.

In regard to claims 3 and 4, the method requires "receiving a body fluid or tissue sample" or "receiving a color image". It is unclear as to where the image is received. Does this occur on a computer or on film? Clarification is requested.

In regard to claims 3, 20, 21, and 34, the method requires "measuring a biologically significant signal level". It is unclear as to the metes and bounds of "biologically significant". Is there a certain threshold that defines biologically significant?

In regard to claim 6, the claim recites " whose value of the one coordinate signal lies within a predetermined range". Firstly, it is unclear as to which coordinate the claim refers? The coordinate that represents the Red, Green, Blue (RGB) intensity or a coordinate of the Hue, Luminance, and Saturation (HLS) coordinate recited in claim 5? Secondly, it is unclear as to the parameters of a "predetermined range". What range? (This applies also to claims 6,7, 24, and 25) Clarification is requested.

In regard to claims 8 and 26, the claims recite "a predetermined selection criteria". It is unclear as to what is meant by a "predetermined selection criteria". Selection for what? Certain color? Size? Shape? Clarification is requested.

In regard to claims 16 and 34, the claims recite "processing substantially only rare cell areas". It is unclear as to the metes and bounds of "substantially". Does this mean that only rare cells are processed? Are other cells processed, as well? Clarification is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-37 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,169,816 B1 (Ravkin).

The instant claims are drawn to a computer-implemented method and a computer software product for processing an image signal. In regard to claims 1, 19, and 37, Ravkin teaches computer implemented imaging a smear of fetal nucleated red blood cells (NRBCs) and other objects, such as red blood cells (RBCs) and white blood cells (WBCs). The objects in the sample are stained with a fluorescent dye that selectively stains nuclei and a dye that selectively stains fetal hemoglobin in the cytoplasm of fetal NRBCs. These include two different illumination schemes, such that candidate regions of interest (blobs) are identified for further processing (column 1, lines 65-67 to column 2, lines 1-20). The invention is directed to an evaluation that includes enrichment of fetal NRBCs from maternal blood, positive identification of fetal NBRCs (signal one), and genetic analysis (signal two) (column 3, lines 30-33).

In regard to claims 2, 3, 20, and 21, Ravkin teaches that a set of features that identify fetal NRBCs are created to distinguish them from other types of cells. This is done by creating contrast in cells containing fetal hemoglobin and another type of contrast in cells having a nucleus. The slide is reacted with a reagent (antibody) to produce a signal (column 3, line 58-667 to column 4, lines 1-6). The images are processed to provide derivative images that are correlated to a region of interest. From there further analysis of only the region of interest is performed, such that the image falls into a specific class of object (column 7, lines 44-57).

In regard to claims 4-12 and 22-30 Ravkin teaches the following image acquisition steps, meeting the limitation of the instant claims:

Separate bright field and fluorescent images are acquired in each field. For the absorption image, epi-illumination is blocked by an opaque segment of the excitation filter wheel, and visible light source sends red light through the specimen camera (column 7, lines 60-

67). For the fluorescent image, transillumination is blocked and the specimen is illuminated by UV source. The images are then balanced so that the background corresponds to mid-gray. The image shows the NRBCs having cytoplasm (black) surrounding nucleus (white) against a gray background (column 8, lines 8-30).

In regard to claims 13-16 and 31-34, Ravkin teaches that upon combining the two images optically, they need to be separated digitally. A background gray level is first determined. The whole field is then measured and a histogram of the number of pixels at each possible intensity level is constructed (column 8, lines 31-36). The histogram is then smoothed by adjacent averaging and the intensity corresponding to the top of the highest peak in the histogram is defined as the background value of light intensity (column 8, lines 36-41). The combined images are separated into below-the-background component and above-the background component accomplished by comparing the background value to the image on a pixel-by-pixel basis. This process is similar to subtraction with saturation. This produces separate positive and negative images, which are two separate contrasts dissected from a single image (column 8, lines 42-50).

In regard to claims 17, 18, 35, and 36, the images are automatically registered, either as one image or as separate images (column 9, lines 4-12).

Claims 1-4, 19-22, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,136,540 (Tsipouras et al.).

The applied reference has common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In regard to claims 1-4, 19-22, and 37, Tsipouras et al. teach a computerized method of:

(i) receiving a digitized color image of a sample, which has been subjected to fluorescence in situ hybridization under conditions to specifically hybridize a fluorophor-labeled probe to a target nucleic acid; (ii) processing the image to separate objects of interest; (iii) measuring parameters in the object of interest to enumerate objects having specific characteristics; and (iv) analyzing the enumeration of objects with respect to a statistically expected enumeration to determine the genetic abnormality (column 3, lines 33-43). Fetal cells are analyzed from maternal blood in one embodiment, as described at column 5, lines 62-67). It is further described that RGB color values are used to distinguish different targets, some which may be labeled by more than one fluorophor (column 12, lines 43-55).

Claims 1-4, 19-22, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,221,607 B1 (Tsipouras et al.).

The applied reference has common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In regard to claims 1-4, 19-22, and 37, Tsipouras et al. teach a computerized method of:

(i) receiving a digitized color image of a sample, which has been subjected to fluorescence in situ hybridization under conditions to specifically hybridize a fluorophor-labeled probe to a target nucleic acid; (ii) processing the image to separate objects of interest; (iii) measuring parameters in the object of interest to enumerate objects having specific characteristics; and (iv) analyzing the enumeration of objects with respect to a statistically expected enumeration to determine the genetic abnormality (column 3, lines 38-48). Fetal cells are analyzed from maternal blood in one embodiment, as described at column 6, lines 1-5. It is further described that RGB color values are used to distinguish different targets, some which may be labeled by more than one fluorophor (column 12, lines 52-59).

No claims are allowed.

Inquiries

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242, or (703) 308-4028.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lori A. Clow, Ph.D., whose telephone number is (571) 272-0715. The examiner can normally be reached on Monday-Friday from 10 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Woodward, Ph.D., can be reached on (571) 272-0722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

Lori A. Clow, Ph.D.
June 27, 2004
Lori A. Clow

MARJORIE MORAN
PATENT EXAMINER
Marjorie A. Moran
6/28/04